



EMC

TEST REPORT

REPORT NO. : F87032308
MODEL NO. : PN7701
DATE OF TEST : Apr. 1, 1998

PREPARED FOR : NPG DISPLAY LTD., TAIWAN BRANCH

ADDRESS : 2FL-1, NO. 70, SEC. 2, TUN HWA S. RD.,
TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	HP	VI. SERIES 4 5/100	B94VECTRA500T	Nonshielded Power (1.8m)
2	KEYBOARD	ACER	6311	CQ86311-K	Shielded Signal (1.1m)
3	MOUSE	MICROSOFT	D302, 426	C3K5K5COMB	Shielded Signal (3.0m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.8m)
5	MODEM	DATATRONICS	1200CK	E2O5OV1200CK	Shielded Signal (1.2m) Nonshielded Power (1.8m)
6	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	N/A

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site. Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594A	3144A00308	Sept. 1, 1998
HP Preamplifier	8447D	2944A08119	Aug. 2, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 17, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112	2086	Dec. 26, 1998
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 26, 1998

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

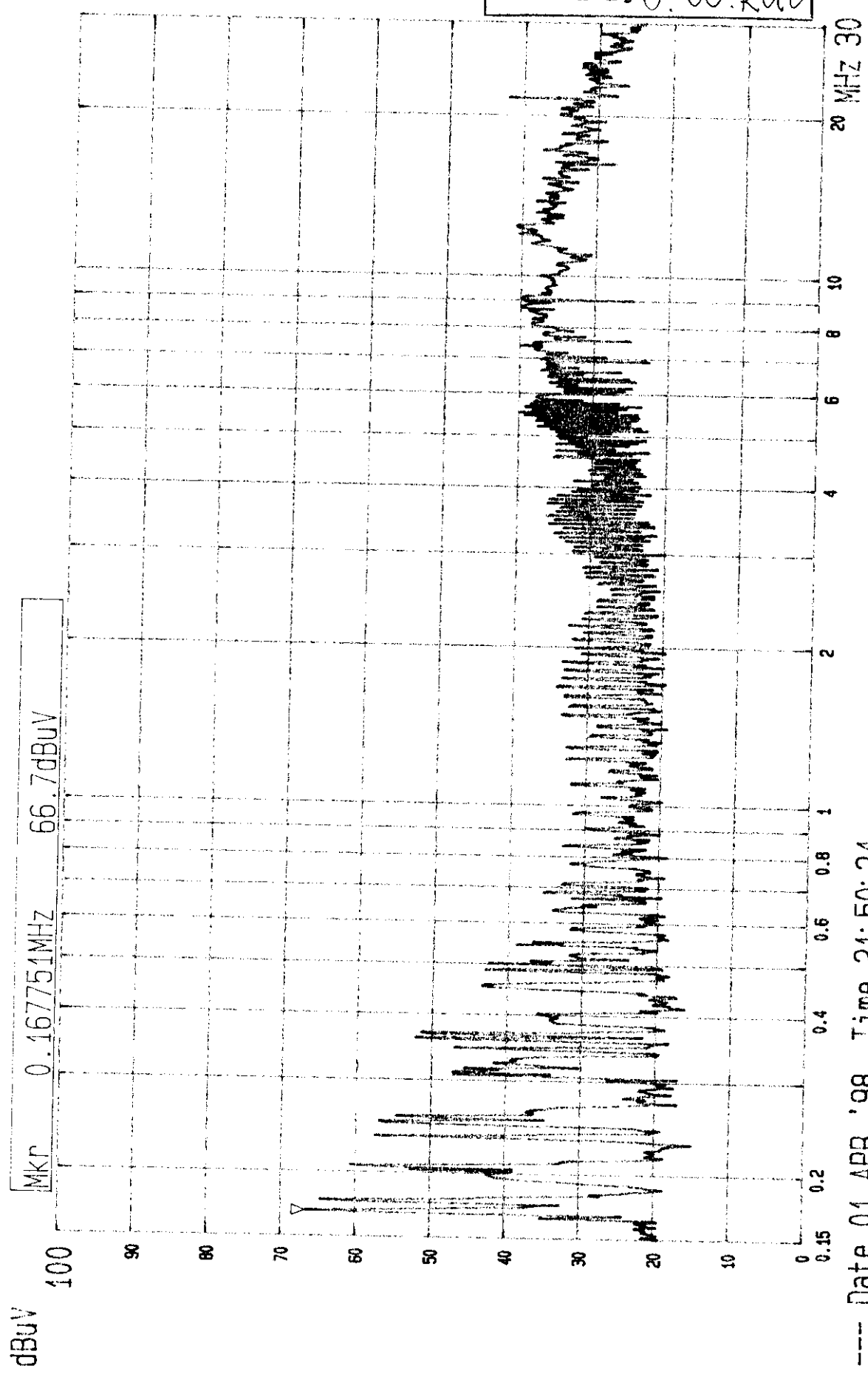
2. The calibration interval of the above test instruments is 12 months.
And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 23, 1998
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 24, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	Aug. 1, 1998
EMCO-L.I.S.N.	3825/2	9204-1964	July 22, 1998
Shielded Room	Site 2	ADT-C02	N/A

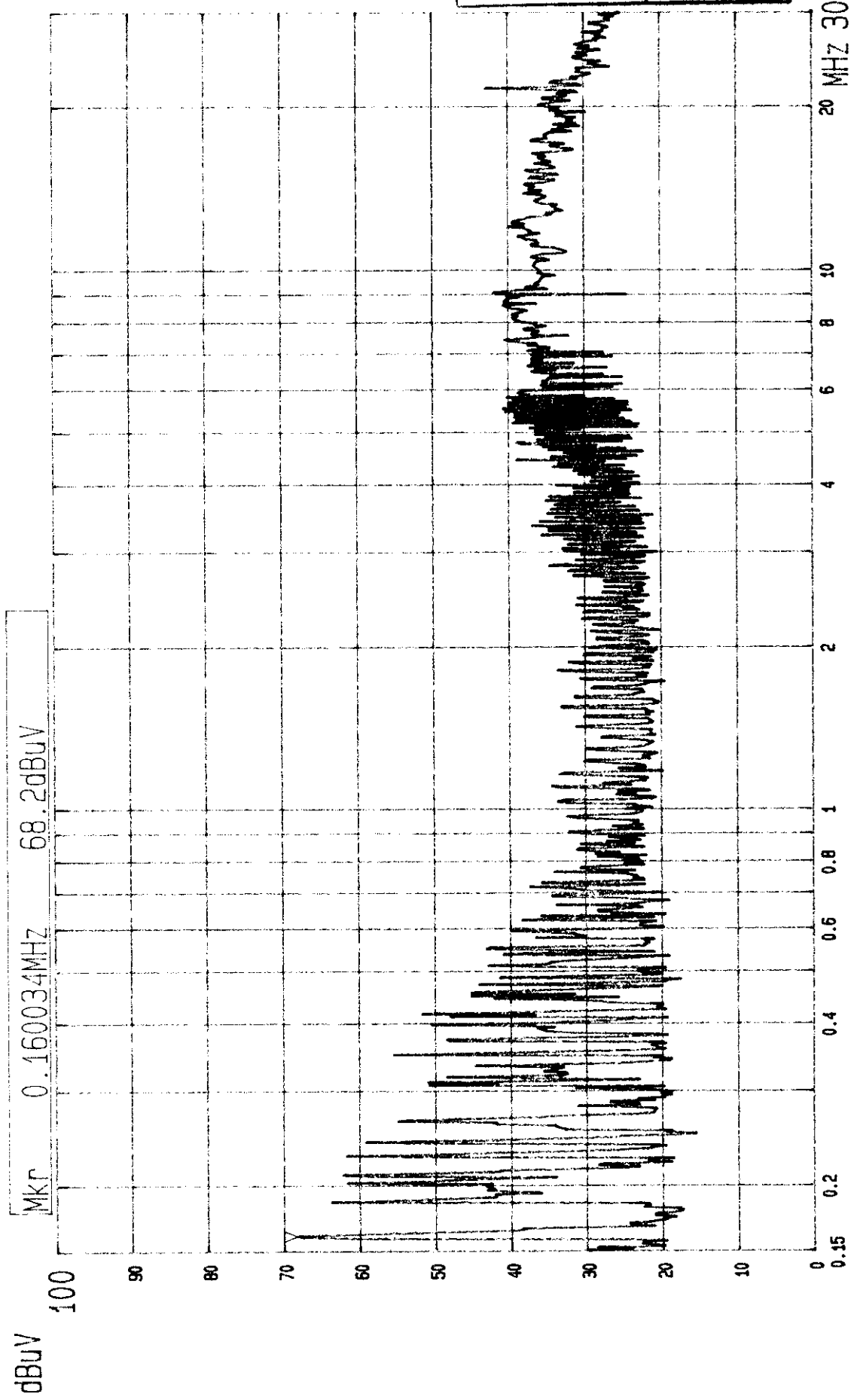
Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.
And the calibrations are traceable to NML/ROC and NIST/USA.



---- Date 01.APR.'98 Time 21:50:24
CISPR 22 CLASS B CONDUCTION TEST
MODEM: PN7701 1280X1024 64KHZ 60Hz

(PEAK VALUE)
ADT CORP.
LISN: N



[--- Date 01.APR.'98 Time 21:46:07
CISPR 22 CLASS B CONDUCTION TEST
MODEM: PN7701 1280X1024 64KHZ 60HZ
(PEAK VALUE)
ADT CORP.
LISN: L



4.3 TEST DATA OF RADIATED EMISSION

EUT: COLOR MONITOR

MODEL: PN7701

MODE: 1280x1024 (64 kHz)

ANTENNA: CHASE BILOG CBL6112

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: J. W. KUO

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
75.83	8.4	13.9	22.3	30.0	-7.7
108.32	13.8	10.4	24.2	30.0	-5.8
129.97	14.6	9.3	23.9	30.0	-6.1
130.00	14.6	10.5	25.1	30.0	-4.9
162.48	12.4	13.3	25.7	30.0	-4.3
173.26	12.2	11.1	23.3	30.0	-6.7
184.14	12.4	14.6	27.0	30.0	-3.0
194.97	13.0	13.9	26.9	30.0	-3.1
216.65	14.1	12.3	26.4	30.0	-3.6
227.44	14.6	11.4	26.0	30.0	-4.0
238.30	15.1	18.7	33.8	37.0	-3.2
249.14	15.7	17.9	33.6	37.0	-3.4
259.97	17.1	15.9	33.0	37.0	-4.0
270.82	17.3	15.7	33.0	37.0	-4.0

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
 2. Correction Factor(dB/m) = Ant. Factor(dB/m) + Cable loss(dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



6. ATTACHMENT I-TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS:

Color Picture Tube:	43.1cm/17 inches (viewable 15.6") size flat square CRT, 90 degree deflection. Dot type black matrix, Non-glare anti-static coating. Medium short persistence		
Dot Pitch	0.28mm		
Scan Frequency	Horizontal 30 to 69 kHz (Automatically) Vertical 55 to 100 Hz (Automatically)		
Max. Resolution	1280x1024		
Input Signal	Video: Analog 0.7 Vp-p, 75 ohm positive Sync.: Separate sync.: TTL level Horizontal: sync.: Positive/Negative Vertical sync.: Positive/Negative Composite sync.: TTL level Positive/Negative		
Active Display Area	260mm (H) x 195mm (V)		
Input signal connector	Analog RGB, Mini D-Sub 15 pin		
Rated Voltage	AC 100V-240V 50/60 Hz		
Dimension	403mm (W) x 426mm (H) x 446mm (D)		
Weight	17.5Kgs		
Environmental Consideration	Operating	Temperature	5°C to 35°C
		Humidity	20% to 80%
	Storage	Temperature	-20°C to 60°C
		Humidity	10% to 90%



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
- (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
- (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- Note: (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
- (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



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**1. CERTIFICATION**

Issue Date: April 16, 1998

Product : COLOR MONITOR
Trade Name : NEC
Model No. : PN7701
Applicant : NPG DISPLAY LTD. TAIWAN BRANCH
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on Apr. 1, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY: J. W. Kuo, DATE: 4/16/98
(J.W. Kuo)

CHECKED BY: Sharon Hsiung, DATE: 4/16/98
(Sharon Hsiung)

APPROVED BY: Mike Su, DATE: 4/16/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	PN7701
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.8m)

Note: The EUT is a 17" color monitor with resolution up to 1280x1024.

There are two ferrite cores on the video cable outside the monitor.

For more detailed features description, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.



TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR**MODEL: **PN7701**MODE: **1280x1024 (64 kHz)**

ANTENNA: CHASE BILOG CBL6112

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: *J. W. KUO*

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.48	17.9	3.6	21.5	30.0	-8.5
44.53	12.0	14.3	26.3	30.0	-3.7
75.82	7.6	18.3	25.9	30.0	-4.1
86.65	10.2	16.0	26.2	30.0	-3.8
97.51	11.0	14.1	25.1	30.0	-4.9
108.32	12.8	13.2	26.0	30.0	-4.0
129.99	15.3	10.5	25.8	30.0	-4.2
162.48	12.1	10.7	22.8	30.0	-7.2
173.27	12.4	13.9	26.3	30.0	-3.7
184.13	12.8	14.0	26.8	30.0	-3.2
194.99	13.4	12.6	26.0	30.0	-4.0
216.62	14.3	11.7	26.0	30.0	-4.0

REMARKS :

1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range	:	0.15 - 30 MHz (Conducted Emission) 30 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	25 °C
Humidity	:	53 %
Atmospheric Pressure	:	1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -5.2 dB at 0.155 MHz Minimum passing margin of radiated emission: -3.0 dB at 184.14 MHz

Note: The EUT was pretested under the following resolution & horizontal synchronization speed mode:

- 1280x1024mode (64 kHz),
- 1024x768 mode (69 kHz),
- 640x480 mode (31.5 kHz)

The worst emission levels were found under 1280x1024mode (64 kHz) and therefore the test data of only this mode is recorded.

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. PC sends "H" messages to monitor (EUT) and monitor displays "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. Repeat steps 3-7.



4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR**

MODEL: **PN7701**

MODE: **1280x1024 (64 kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: *J. W. KUO*

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.155	60.50	20.70	60.20	21.90	65.68	55.68	-5.2	-35.0	-5.5	-33.8
0.200	56.90	37.90	56.40	18.70	63.61	53.61	-6.7	-15.7	-7.2	-34.9
0.380	46.50	34.60	45.30	32.70	58.28	48.28	-11.8	-13.7	-13.0	-15.6
1.667	25.60	-	32.10	-	56.00	46.00	-30.4	-	-23.9	-
3.721	32.00	-	33.60	-	56.00	46.00	-24.0	-	-22.4	-
7.343	25.40	-	26.20	-	60.00	50.00	-34.6	-	-33.8	-

- Remarks:
1. “*”: Undetectable
 2. Q.P. and AV. Are abbreviations of quasi-peak and average individually.
 3. “-”: The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value